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L187,422

# PATENT SPECIFICATION



DRAWINGS ATTACHED

L187,422

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## COMPLETE SPECIFICATION

### Fasteners

We, ILLINOIS TOOL WORKS INC., a corporation organized under the laws of the State of Delaware, United States of America, of 8501 West Higgins Road, Chicago, Illinois 60631, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

According to this invention a fastener is made of one piece of a resilient plastics material and consists of a head and means adapted to retain the fastener to an apertured workpiece; the head including a workpiece-engaging portion, a flexible wall portion connected with a first margin of the workpiece-engaging portion and deviating from the workpiece-engaging portion so as to provide a pocket between these two portions for accommodating elongated objects, and substantially rigid means extending from a second margin of the workpiece-engaging portion opposite the first margin, and forming a throat, open towards the pocket, for receiving a free extremity of the wall portion when the wall portion is bent; this throat-forming means including a first shoulder spaced laterally from the workpiece-engaging portion, there being a second shoulder on the free extremity of the wall portion, the first shoulder being capable of engagement with the second shoulder to detachably retain the free extremity of the wall portion within the throat, the disposition of the throat and the wall portion being such as to ensure an interlocking relationship of the first and second shoulder when interengaged.

One example of a fastener embodying the present invention will now be described with reference to the accompanying drawings in which:—

Figure 1 is a fragmentary perspective view of an apertured workpiece, having in readiness

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for association therewith, a fastener according to the present invention;

Figure 2 is a vertical transverse section of the workpiece and fastener of Figure 1, after the fastener has been engaged with the workpiece;

Figure 3 is a detailed transverse section taken substantially along the line 3—3 of Figure 2;

Figure 4 is a vertical section similar to Figure 2, showing the free extremity of a resilient wall portion of the fastener head sprung inwards towards the workpiece so as to trap a plurality of conductors carried thereby;

Figure 5 is a horizontal section affording a plan view of the fastener as shown in Figure 2.

The fastener is moulded in one piece from resilient plastics material, and has a shank and a head formed integral with the shank at one extremity thereof. The shank extends from the head.

In Figures 1 to 5, inclusive, a fastener is shown in association with an aperture 16 of a workpiece 18. As shown in Figures 2, 4 and 5, the shank 12 is adapted to be inserted into the aperture 16, and the head 14 is adapted to bear against one side of the workpiece 18.

The construction of the shank 12 is described and claimed in our Application No. 15913/67, (Serial No. 1,187,421) from which the present Application is divided.

The shank 12 includes notches 25 which snap into locking relation with respect to the workpiece 18 when the head 14 has been finally clamped against the workpiece surface as shown in Figure 2.

It has been found advantageous to employ a fastener head possessing axial resiliency. It will be noted from Figure 1 that the head 14 includes a central portion 26 having two arms 28 extending from opposite margins thereof and inclined slightly with respect to the sur-

5 faces of the portion 26. Thus, as the free extremities of the arms 28 are brought into engagement with the workpiece surface, they will flex and permit the central portion 26 to be drawn into engagement with the surface of the workpiece 18 as shown in Figure 2.

10 The head 14 is designed to accommodate and carry a plurality of elongated conductors 30. These conductors are received within a pocket 31 defined by the central portion 26 on one side, and a laterally spaced flexible wall portion 32 connected with the bottom margin of the head portion 26 and deviating from the portion 26. At the upper margin of the central portion 26, opposite the margin to which the wall portion 32 is connected, are laterally extending substantially rigid means in the form of a flange 27 terminating in a lip 38 forming a shoulder 33 overlying and spaced from the portion 26. The shoulder 33 extends downwards, as viewed in Figure 2, towards the connection of the wall portion 32 with the portion 26. The lip and the flange 27 form a throat open towards the bottom and adapted to accept the free upper extremity 34 of the wall portion 32. On this free upper extremity 34 is a resilient tang 35 extending angularly from the side of the wall portion 32 facing towards the portion 26, and on the opposite side is a shoulder 36 lying between lateral abutments 37. When the portion 26 and 32 occupy the relative positions illustrated in Figure 2, their upper margins are spaced apart whereby to facilitate the insertion of the conductors 30 within the pocket 31.

40 After the desired number of conductors 30 have been placed in position, the upper extremity of the wall portion 32 is bent towards the portion 26 to enable it to attain the position shown in Figure 4, in which the upper extremity 34 lies within the throat. In this position, the shoulder 33 formed by the lip on the flange 27 and the shoulder 36 on the wall portion 32 come into interengagement, and the resilient tang 35 yieldably engages the central portion 26, thereby urging the two shoulders into interlocking relationship. Due to the inherent resiliency of the plastics material from which the fastener is made, the bending

of the wall portion 32 from its as-moulded shape shown in Figure 2 to the engaged shape shown in Figure 4 involves setting up stresses in the wall portion 32. These stresses tend to reduce the bend, and so urge the upper extremity 34 to remain within the throat. But the interengaged shoulders 33, 36 can be disengaged by simply urging the portion 32 away from the head portion 26 by the application of sufficient force.

#### WHAT WE CLAIM IS:—

1. A fastener made of one piece of a resilient plastics material and consisting of a head and means adapted to retain the fastener to an apertured workpiece; the head including a workpiece-engaging portion, a flexible wall portion connected with a first margin of the workpiece-engaging portion and deviating from the workpiece-engaging portion so as to provide a pocket between these two portions for accommodating elongated objects, and substantially rigid means extending from a second margin of the workpiece-engaging portion, opposite the first margin, and forming a throat, open towards the pocket, for receiving a free extremity of the wall portion when the wall portion is bent; this throat-forming means including a first shoulder spaced laterally from the workpiece-engaging portion, there being a second shoulder on the free extremity of the wall portion, the first shoulder being capable of engagement with the second shoulder to detachably retain the free extremity of the wall portion within the throat, the disposition of the throat and the wall portion being such as to ensure an interlocking relationship of the first and second shoulders when interengaged.

2. A fastener according to claim 1, wherein the wall portion includes means for resiliently urging the first and second shoulders into the interlocking relationship when interengaged.

3. A fastener according to claim 1, having a head substantially as described with reference to the accompanying drawings.

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